never require as much labor as that displaced or it would not pay to introduce the new machinery. Whether output will increase or not will depend upon prices, income, and other factors.

Second, technological change may also create employment by making possible new industries and products, and by contributing to the expansion of the economy. Automation typically results not only in a cheaper and better way of doing what was done before, but also in the possibility of doing and producing new things.

Thus, the job-creating potential of automation is present, but there is nothing automatic about it. It depends upon many things—price policies, wage policies, investment policies, and the maintenance of a high level of effective demand in the economy.

(2) Automation always results in more interesting jobs, requiring greater skill and training.

If this is meant to apply to the specific factory or office situation it is incorrect. Prof. James Bright of Harvard and others who have looked at particular examples of the introduction of superior machinery report that the effects of automation vary greatly.

Sometimes the jobs that are eliminated required considerable training and experience, and they are replaced with jobs that are relatively simple and easy to learn. The displaced worker who must seek employment in some other industry or occupation will frequently find himself forced to accept work demanding far less skill and experience than his old job required. Automation usually has a cost, and the displaced worker pays it.

If one takes a national and longrun view of automation, it is clear that skill and educational requirements will be upgraded. Similarly, technological unemployment tends to disappear in the long run. The fallacy lies in the failure to realize that what is true in the long run need not be true in the short, and what is true in general is not true in some specific cases.

(3) Any problem created by automation can be solved by the individual firm concerned or by local government.

Efforts by individual firms, unions and local governments to deal with the problems created by automation are to be commended. We should not, however, blindly put our trust in them simply out of fear or dislike of the Federal Government. Some Federal activities are warranted on economic grounds, and might obviate the necessity for the Government to assume a much larger role.

For example, a program to make the State employment services more responsive to national needs and leadership would help our labor markets function more effectively, but there is strong opposition to such a program.

(4) "Conventional" jobs that represent truly "productive" work are disappearing.

If one defines "conventional" jobs as those that exist at present, and if one limits "productive" work to the production of commodities on farms and in factories then this statement is true—but rather meaningless. Of course, technological change will result in changes in the type of work required. It always has. One hundred years ago most Americans worked on farms. Today fewer than 10 percent do.

Each generation has its own ideas about what is a "conventional" job. Today jet pilots and TV repairmen fall into that category, but 20 years ago they were not only unconventional but unknown. Moreover, not all of the fields of expanding employment opportunity are new ones. Teaching and nursing, for example, are old and "conventional" and job opportunities are growing rapidly.

The notion that some kinds of work are productive and others are not can be traced to a Marxian fallacy (inherited from Adam Smith) that attempts to distinguish between the production of commodities and of services. To this day, the U.S.S.R. refuses to include the services of doctors, teachers, and similar workers in its gross national product, although in other contexts the value of these services is extolled.

Similarly, Federal aid to education is blocked, although underinvestment in education in low income States is economically wasteful and a prime cause of unemployment. Even such obvious programs as retraining are opposed or hampered by requirements that limit training to local job opportunities.

Given the fact that automation does pose some problems, that our national economy is highly complex and the parts are intimately related, and given the inability of State and local governments to deal adequately with many of the social and economic difficulties now before them, it is reasonable to conclude that the Federal Government must play an important and positive role.

What should this role consist of? First and foremost, the economy must be kept operating at a high level so that output can expand and workers displaced by technological change can seek jobs in a buoyant economy. Second, the costs of change should be distributed fairly throughout the economy. Third, strenuous efforts should be made to facilitate reemployment of displaced workers.

In the short run, this means support of retraining and relocation programs, a vastly expanded employment service and the removal of artificial barriers to employment such as racial prejudice. In the long run, it calls for a large-scale shoring up of our educational system, a revolutionary improvement in our approach to vocational education and technical training, and the development of attitudes and institutions appropriate to the concept of education as a life long process—not one that terminates with a "dropout" or a diploma.

To sum up: Automation does pose problems. These problems are not unprecedented, either in kind or in degree. But, solutions will not come automatically.

We should not fear automation or try to retard it. On the contrary, we should welcome it, and try to accelerate it. Automation is the key to a higher standard of living at home and to increasing our ability to help less fortunate peoples abroad. There is no need to panic, or to give up our competitive free-market system for some vague and unspecified controls.

There is need to face the problems with coolness, sympathy, intelligence, and determination. A do-nothing attitude is unwise and unjust. The greatest danger is not that technological change will come too quickly, but that our institutions will adapt too slowly to the problems and the promise of automation.

The ultimate scarce resource is manpower. At the present time about 6 percent of our labor force is unemployed. Some 2 or 3 percent more would probably seek work if it were available, while short work weeks for those currently employed represent perhaps an additional 2 or 3 percent of involuntary unemployment. One must subtract, however, about 3 percent for frictional unemployment—that which is built into a dynamic economy—this being about the minimum level consistent with efficiency and the right of workers to change jobs whenever they wish. On balance, the removal of all involuntary unemployment would raise labor input by 7 or 8 percent.

Some increase in output requires no additional labor—it needs only increased demand—but even allowing for this, it is difficult to see how a total increase of more than 10 to 15 percent could be achieved solely by eliminating involuntary unemployment. Such an increase would be tricky, but would leave most of us [illegible]

(3) Automation will result in mass unemployment because there will not be enough purchasing power to buy the increased output.

This is a more sophisticated version of the "overproduction" fallacy. It is not factually false, but it is illogical. It is based on a circular argument that runs as follows: no purchasing power equals unsold goods equals unemployment equals no purchasing power.

This could happen. Indeed, it did happen in the 1930's. But it is incorrect to argue that it must happen. Whether it does or not will depend primarily on whether we are able to manage our monetary and financial affairs in a sensible manner. Our tools for monetary and fiscal policy are admittedly imperfect, but most economists are prepared to bet that they are not so imperfect that we need suffer mass unemployment because of a shortage of purchasing power.

THE NUCLEAR TEST BAN NEGOTIATIONS

Mr. DODD. Mr. President, as my colleagues are aware, I have had a public exchange of statements on the subject of the nuclear test ban negotiations with Mr. Adrian Fisher, Deputy Director of the Arms Control and Disarmament Agency.

On March 4 Mr. Fisher issued a communication to the press in reply to a letter which I had written to the editor of the Washington Post and which was printed in their edition of March 1.

On March 7 the Post consented to print a communication from me replying to Mr. Fisher's presentation.

These two items were entered into the CONGRESSIONAL RECORD on March 7.

On March 21 Mr. Fisher sent me a personal letter, pursuing the discussion further, and attempting to persuade me of the validity of our present position in the test ban negotiations. At the conclusion of his letter, Mr. Fisher asked that I insert it into the CONGRESSIONAL RECORD. I told him over the phone, after receiving his letter, that I would be happy to do so.

I felt that Mr. Fisher made an exceedingly careful and thoughtful presentation in his communication of March 21, and that it deserved a careful and detailed reply. The drafting of this reply, which runs 20 typewritten pages, required a good deal of time; and it is because of this, that my reply to Mr. Fisher was not delivered until this afternoon.

Mr. President, I ask unanimous consent to insert into the RECORD, at the conclusion of my remarks, both Mr. Fisher's letter of March 21, and my reply to Mr. Fisher of today's date. Despite the length of this exchange of correspondence, I hope my colleagues will take the trouble to read it. There are some subjects that one can deal with adequately in a few pages. But the problem of the nuclear test ban negotiations is so complex and many sided that one can only deal with it properly by going into it in detail.

I should like to point out, Mr. President, that Mr. Fisher and I are friends of many years' standing. I strongly supported the establishment of the Agency

High Radiation Test Revealed

Yield Nears Level Of Neutron Bomb

By EARL H. VOSS
Star Staff Writer

The United States has developed a nuclear weapon with "enhanced radiation" that may approach the potency of the so-called "death ray" or neutron bomb.

Adrian S. Fisher, deputy director of the Arms Control and Disarmament Agency disclosed the development in a March 14 letter to Senator Dodd, Democrat of Connecticut, released today.

In discussing the new development, Mr. Fisher called it an "enhanced radiation weapon of a type now available."

Senator Dodd has been an advocate of continued nuclear testing to develop the so-called neutron bomb. The neutron bomb would have a minimum blast and heat effect but would emit an enormous radiation of deadly neutrons that could kill people while preserving structures.

In his reply to the Fisher letter, also released today, Senator Dodd said he had known of the "enhanced radiation" weapon, but had "hesitated to refer to it because of its classification."

Asks Dodd Support

Mr. Fisher gave no indication whether the weapon has already been stockpiled or deployed with American military forces. Senator Dodd, by asking Mr. Fisher whether the Defense Department actually has established production requirements for the weapon, indicated he did not know.

Mr. Fisher mentioned the existence of the weapon to support a plea for Senator Dodd's backing of the administration's proposed nuclear test ban treaty.

The weapon's performance, Mr. Fisher indicated, would be close enough to that of the pure-fusion neutron bomb to enable the United States to stop testing for the development of the neutron bomb.

Conventional hydrogen bombs use an atomic bombs or fission bomb, to set off the fusion process responsible for the release of energy in the hydrogen bombs. Scientists have been seeking to eliminate the fission trigger to produce a "pure fusion" weapon, thus eliminating the relatively heavy and expensive fissionable materials in the trigger.

Pure fusion weapons' "primary significance would be in providing a cheaper substitute for the explosive component of our very large stockpile of fusion weapons," Mr. Fisher said.

Senator Dodd, in his reply, agreed that pure-fusion weapons would be much cheaper, but he claimed other advantages.

The Senator said the pure-fusion weapon, not yet developed, could be "tailored in far lower, more discriminating yields" of tens of tons of TNT equivalent, instead of thousands of tons. The pure-fusion weapon would also be "considerably lighter and therefore more versatile and effective," Senator Dodd contended.

Sees Other Advantages

Senator Dodd told Mr. Fisher that scientists and military men "believe that the neutron bomb would have revolutionary implications."

In addition to being cheaper, he said it "would be much more effective than fission weapons; it would do little damage to our allies' urban centers, and, of great importance, it would virtually eliminate widespread fallout." The Senator said this "would enable our troops to follow up on a tactical nuclear barrage without delay and without danger to themselves. . . . The absence of significant fallout would reduce the political opposition of our allies to the use of tactical nuclear weapons and, to this extent, would make the resort to such weapons far more plausible."

Senator Dodd expressed the hope that "top priority will be accorded" the "enhanced radiation" weapon as an interim system "until the neutron bomb becomes available."

Mr. Fisher said the pure-fusion weapon, or neutron bomb, would not provide "a great advantage" to either the United States or the Soviet Union, considering the "very large numbers" of other nuclear weapons available to both sides by the time the pure-fusion device could be stockpiled.

"Such a weapon," Mr. Fisher wrote, "would be of greater significance to other countries that do not as yet have a nuclear capability. For this reason, an inhibition to the development of fusion weapons be to our net advantage."

Senator Dodd contended a test ban treaty probably would not inhibit Soviet development of pure-fusion weapons because they could be tested at such small yields they could not possibly be detected.

The Fisher-Dodd exchange of letters covered the whole spectrum of arguments for and against a nuclear test ban.

Mr. Fisher took the line previously elaborated by other disarmament agency officials that the risks of continued testing exceed the risks of an effective test ban.